

## **Appendix 3**

# **An Illustrated Example of a HACCP Plan – Processing Cooked Shrimp\* (See Chapter 3)**

### **ASSEMBLING A HACCP TEAM AND ASSIGNING RESPONSIBILITIES (FORM #1)**

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Responsibility: Hazard identification

*Name of the designee:*

- 1.
  - 2.
  - 3.
- 

Responsibility: CCPs determination

*Name of the designee:*

- 1.
  - 2.
  - 3.
- 

Responsibility: Monitoring CCPs

*Name of the designee:*

- 1.
  - 2.
  - 3.
- 

Responsibility: Verification of operations at CCPs

*Name of the designee:*

- 1.
  - 2.
  - 3.
- 

Sample testing and verification:

*Name of the designee:*

- 1.
  - 2.
- 

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\*Example taken from Canadian Food Inspection Agency QMP plan.

## ORGANIZATION CHART AND NARRATIVE (FORM #2)

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|                        |   |
|------------------------|---|
| President/CEO          | Overall responsibility in reviewing the HACCP plan with the Production, Quality Assurance and Sales Managers.   |
| Prodn Manager          | Responsible for everyday production and process operations of the facility. Reviews the HACCP plan with the President, Quality Assurance Manager and Sales Manager. Reports to the President.   |
| Prodn Supervisor/s     | Oversee the daily production and scheduling in the facility, reporting to the Production Manager. Responsible for overseeing all skilled and unskilled personnel in the production, storage, refrigeration and other areas involved in production.  |
| QA Manager             | Reports to the President of the company. Responsible for the HACCP plan and any changes related to the plan. Responsible for handling customer complaints. Oversees the Quality Assurance Technicians involved in sampling, testing and personnel assigned to specific duties in the HACCP plan. Reviews HACCP plan with the President, Production Manager and Sales Manager. |
| Purchase Manager       | Reports to the President. Responsible for purchasing all the raw materials, packaging and labeling materials, etc. Develops product specifications in consultation with the Quality Assurance and Production Managers. Reports to the President.  |
| Sales Manager          | Reports to the President. Responsible for setting up and maintaining customer accounts, dealing with the bank, etc. Oversees all sales representatives and handling of customer complaints. Reviews HACCP plan with the President, Production Manager and Sales Manager.  |
| Maintenance Manager    | Reports to the Production Manager. Responsible for operational setup and maintenance of all the equipment in the facility.  |
| Sanitation Manager     | Reports to the Maintenance Manager. Responsible for developing the SSOPs in consultation with the Production and Quality Assurance Managers. Oversees the daily cleanup and sanitation of the facility following the SSOPs.   |
| Personnel Manager      | Reports to the President. Responsible for personnel matters including maintenance of employee health records.   |
| Transport/Distribution | Reports to the President. Responsible for arranging transport, reefer trucks, ocean cargo, air cargo, etc.  |

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This is only a guideline. Depending on the size of the company, one person may actually be handling more than one function.

**PRODUCT DESCRIPTION (FORM #3)**


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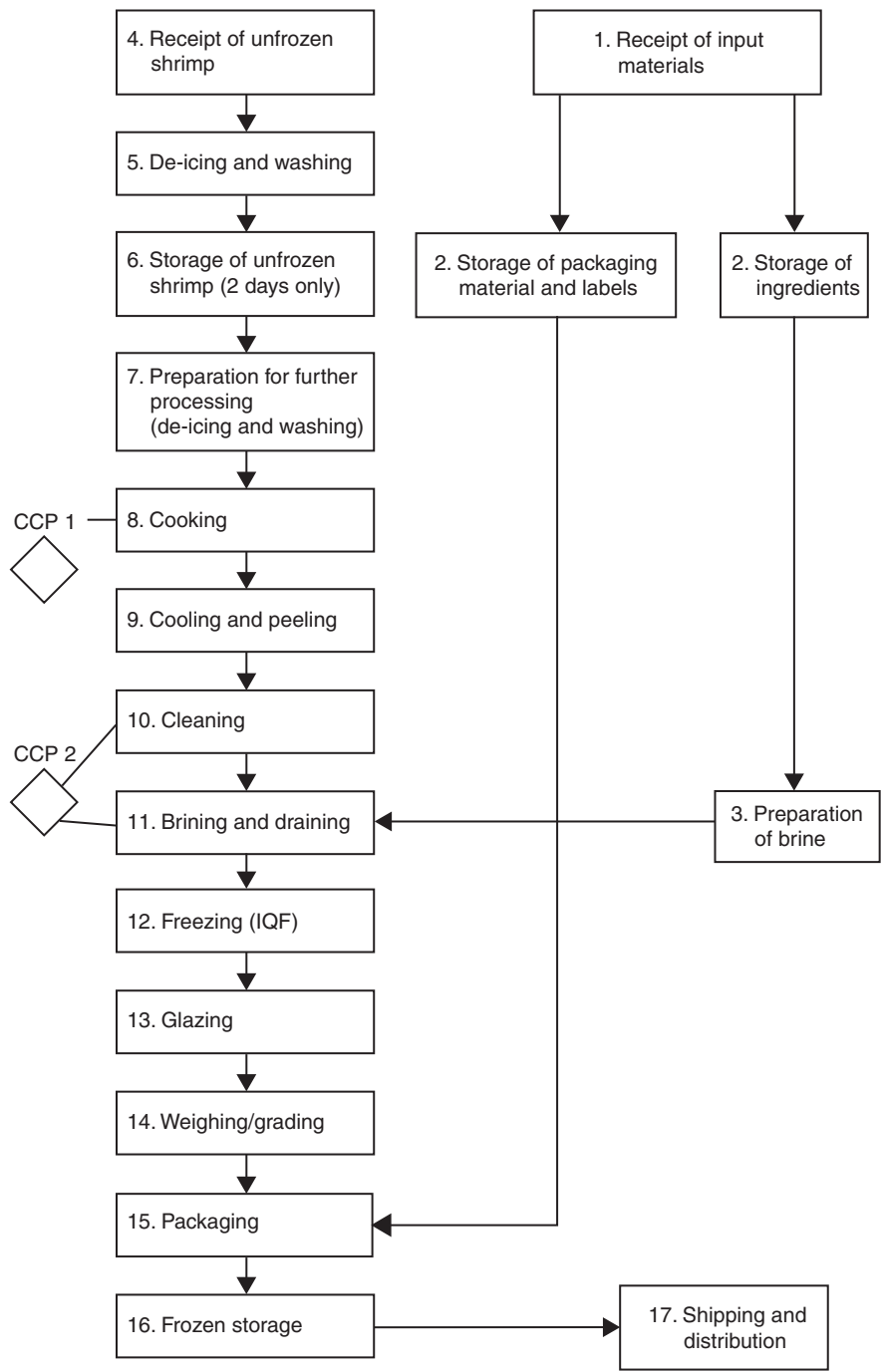
|   |   |
|---|---|
| 1. Product name(s)                          | Frozen cooked peeled shrimp   |
| 2. Source of raw material                   | Locally caught product  |
| 3. Important final product characteristics  | Temperature < -18°C   |
| 4. Ingredients                              | Shrimp, glaze (salt + water)  |
| 5. Packaging                                | Polyethylene bags 300 g/800 g   |
| 6. How the end product is to be used        | Product is thawed and normally consumed without further cooking   |
| 7. Shelf life                               | 6 months after packaging  |
| 8. Where the product will be sold           | Domestic retail<br>International markets<br>High-risk consumer group  |
| 9. Special labeling instructions            | As per Fish Inspection Regulations,<br>Food and Drug Regulations and<br>international specifications<br>Keep frozen |
| 10. Special distribution control shelf life | Store at < -18°C  |

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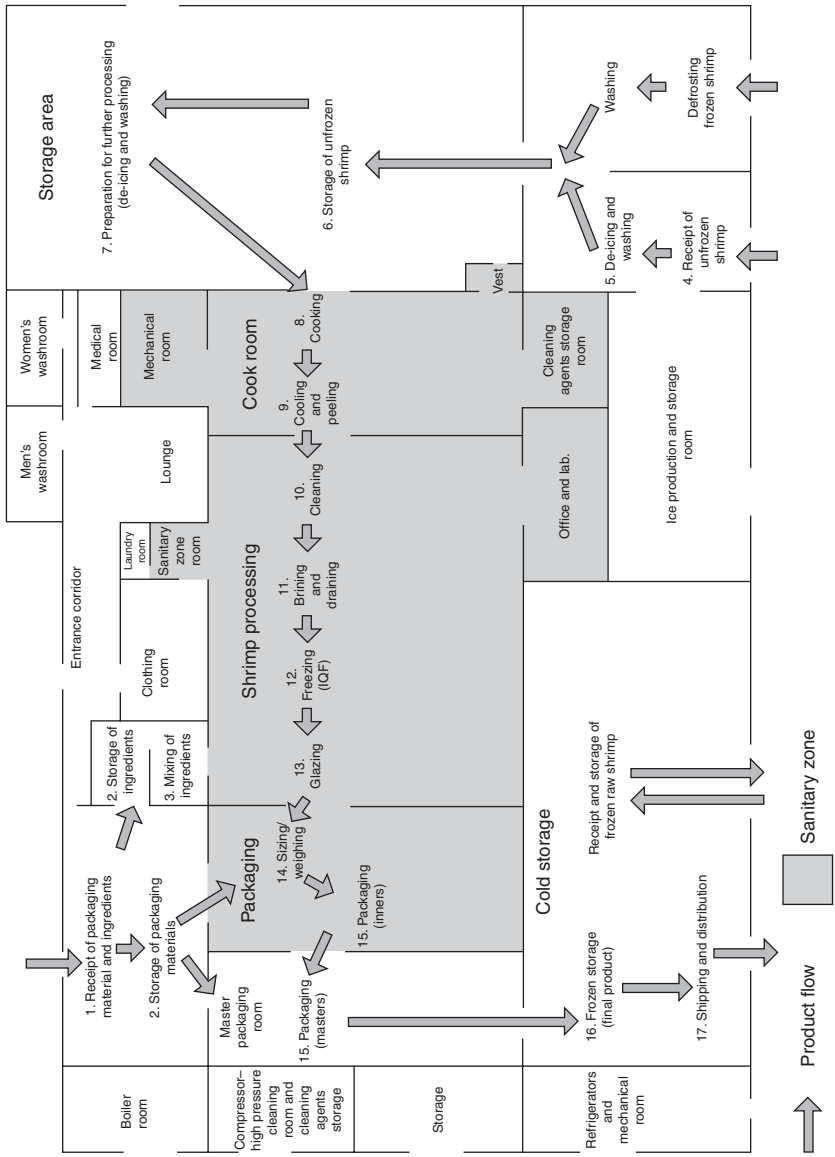
**LIST OF PRODUCT INGREDIENTS AND INCOMING MATERIAL (FORM #4)****Product name: Frozen cooked peeled shrimp**

|                         |  |  |
|-------------------------|--|--|
| Fresh headless shrimp   |  |  |
| Salt                    |  |  |
| Polyethylene bags       |  |  |
| Potassium metabisulfite |  |  |
| Waxed cardboard cartons |  |  |
| Labels                  |  |  |

PROCESS FLOW DIAGRAM (FORM #5)



PLANT SCHEMATIC (FORM #6)



HAZARD ANALYSIS WORKSHEET (FORM #7)

| Ingredient/processing step                                       | Potential hazard introduced or controlled   | Is the potential hazard significant? | Justification for inclusion or exclusion as a significant hazard   | Preventive measures of the significant hazards |
|--|---|--------------------------------------|--|--|
| 1. Receipt of input materials<br>– packaging materials<br>– salt | <i>Biological:</i> Potential for incoming materials to be contaminated during manufacture or transportation<br><br><i>Chemical:</i> Potential for incoming materials to be contaminated during manufacture or transportation<br><br><i>Physical:</i> Potential for incoming materials to be contaminated during manufacture or transportation | No<br><br>No<br><br>No               | Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients<br><br>Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients<br><br>Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients |  |
| 2. Storage of input materials<br>– packaging materials<br>– salt | <i>Biological:</i> Potential for materials to become contaminated during storage<br><br><i>Chemical:</i> Potential for materials to become contaminated during storage<br><br><i>Physical:</i> Potential for materials to become contaminated during storage  | No<br><br>No<br><br>No               | Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients<br><br>Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients<br><br>Not reasonably likely to occur; controlled by SOP – receipt and storage of packaging materials and ingredients |  |

|                               |   |     |  |
|-------------------------------|---|-----|--|
| 3. Preparation of brine       | <i>Biological:</i> Water may be contaminated with pathogens | No  | Not reasonably likely to occur.<br>Controlled through prerequisite program   |
|                               | <i>Chemical:</i> Industrial chemicals                       | No  | Not reasonably likely to occur.<br>Controlled by prerequisite program through SOP for receipt and storage of packaging material and ingredients  |
| 4. Receipt of unfrozen shrimp | <i>Physical:</i> None identified                            | n/a |  |
|                               | <i>Biological:</i> Contamination with pathogens             | No  | The presence or growth of pathogens or parasites on the raw product is not considered significant for three reasons. The product will be cooked at a subsequent processing step, competition from dominant microflora, and the continuous nature of the process                        |
|                               | <i>Chemical:</i> Fuel oil                                   | No  | Not reasonably likely to occur.<br>Controlled by SOPs  |
|                               | <i>Physical:</i> Foreign matter                             | No  | During harvesting and on-board handling, the raw material may become contaminated with pieces of plastic from nets or other materials from the vessel. However, the presence of this material is not considered significant as it will be removed through normal processing operations |

continued

### HAZARD ANALYSIS WORKSHEET (FORM #7) *continued*

| Ingredient/processing step   | Potential hazard introduced or controlled   | Is the potential hazard significant? | Justification for inclusion or exclusion as a significant hazard  | Preventive measures of the significant hazards |
|--|---|--------------------------------------|---|--|
| 5. De-icing and washing  | <i>Biological:</i> Contaminated wash water<br><i>Chemical:</i> Industrial chemicals<br><i>Physical:</i> None identified                   | No<br>No<br>n/a                      | Controlled by prerequisite programs<br>Controlled by prerequisite program   |  |
| 6. Storage of unfrozen shrimp on ice (up to 2 days)                    | <i>Biological:</i> Contaminated ice and water<br><i>Chemical:</i> Industrial chemicals<br><i>Physical:</i> Foreign material               | No<br>No<br>No                       | Controlled by prerequisite program<br>Controlled by prerequisite program<br>Controlled by prerequisite program  |  |
| 7. Preparation of shrimp for further processing (de-icing and washing) | <i>Biological:</i> Contaminated wash water<br><i>Chemical:</i> Industrial chemicals<br><i>Physical:</i> None identified                   | No<br>No<br>n/a                      | Controlled by prerequisite program<br>Controlled by prerequisite program<br>Controlled by prerequisite program  |  |
| 8. Cooking (steam)   | <i>Biological:</i> Pathogen survival ( <i>Listeria</i> )  | Yes                                  | Pathogens that survive the cook will not be eliminated at subsequent processing steps. Processing time and temperature may not be sufficient to kill vegetative pathogens | 1. Cooking<br>2. Employee training             |
|  | <i>Chemical:</i> Industrial chemicals   | No                                   | Controlled by prerequisite program. SOP plant clean-up and sanitation   |  |
|  | <i>Physical:</i> None identified  | n/a                                  | Controlled by prerequisite program  |  |
| 9. Cooling and peeling (mechanical)                                    | <i>Biological:</i> Post-process contamination with pathogens<br><i>Chemical:</i> Industrial chemicals<br><i>Physical:</i> None identified | No<br>No<br>n/a                      | Controlled by prerequisite program<br>Controlled by prerequisite program  |  |



|                          |   |     |   |  |
|--------------------------|---|-----|---|--|
| 10. Cleaning             | <i>Biological:</i> Cross-contamination and recontamination with pathogens | No  | Strict sanitation/hygiene controls for the sanitary zone in prerequisite programs will minimize contamination   | Control process speed to ensure a rapid process (from cooking to freezing) |
|                          | Pathogen growth and toxin formation ( <i>Staphylococcus</i> )             | Yes | The growth of <i>Staphylococcus</i> must be controlled to prevent the formation of the <i>Staphylococcus</i> toxin  |  |
| 11. Brining and draining | <i>Chemical:</i> Industrial chemicals                                     | No  | Controlled by prerequisite program  | Control process speed and ensure no processing delays                      |
|                          | <i>Physical:</i> Shell  | n/a | Trained personnel in place to remove undesirable pieces   |  |
|                          | <i>Biological:</i> Cross-contamination and recontamination with pathogens | No  | Minimized by prerequisite program and SOP for preparation of brine  |  |
|                          | Pathogen growth ( <i>Staphylococcus</i> )                                 | Yes | Prerequisite program minimizes contamination with this pathogen but it will not prevent it entirely. The growth of <i>Staphylococcus</i> must be controlled to prevent the formation of the <i>Staphylococcus</i> toxin |  |
| 12. Freezing (IQF)       | <i>Chemical:</i> Industrial chemicals                                     | No  | Controlled by prerequisite program  | Not reasonably likely to occur due to the continuous nature of the process |
|                          | <i>Physical:</i> None identified  | n/a |   |  |
|                          | <i>Biological:</i> Pathogen growth  | No  | Controlled by prerequisite program  |  |
| 13. Glazing              | <i>Chemical:</i> Industrial chemicals                                     | No  |   | Controlled by prerequisite program   |
|                          | <i>Physical:</i> None identified  | n/a |   |  |
|                          | <i>Biological:</i> Introduction of water-borne pathogens                  | No  | Controlled by prerequisite program  |  |
|                          | <i>Chemical:</i> Industrial chemicals                                     | No  | Controlled by prerequisite program  |  |
|                          | <i>Physical:</i> None identified  | n/a |   |  |

continued

HAZARD ANALYSIS WORKSHEET (FORM #7) continued

| Ingredient/processing step         | Potential hazard introduced or controlled  | Is the potential hazard significant? | Justification for inclusion or exclusion as a significant hazard | Preventive measures of the significant hazards |
|------------------------------------|--|--------------------------------------|--|--|
| 14. Sizing                         | <i>Biological:</i> Cross-contamination and recontamination with pathogens<br><i>Chemical:</i> Industrial chemicals<br><i>Physical:</i> None identified | No<br>No<br>n/a                      | Controlled by prerequisite program                               |  |
| 15. Packaging                      | <i>Biological:</i> None identified<br><i>Chemical:</i> None identified<br><i>Physical:</i> None identified   | n/a<br>n/a<br>n/a                    | Controlled by prerequisite program                               |  |
| 16. Frozen storage (final product) | <i>Biological:</i> None identified<br><i>Chemical:</i> None identified<br><i>Physical:</i> None identified   | n/a<br>n/a<br>n/a                    |  |  |
| 17. Shipping and distribution      | <i>Biological:</i> None identified<br><i>Chemical:</i> None identified<br><i>Physical:</i> None identified   | n/a<br>n/a<br>n/a                    |  |  |

## CCP DETERMINATION (FORM #8)

| Process step                   | Hazard   | Q. #1<br>Do control<br>preventive<br>measures exist?<br><br>No – not a CCP –<br>However,<br>if control preventive<br>measures are required<br>to ensure safety then<br>modify step, product<br>or process. | Q. #2<br>Is the step specifically<br>designed to eliminate<br>or reduce the likely<br>occurrence of the<br>hazard to an<br>acceptable level?<br>No – to Q. #3<br>Yes – CCP | Q. #3<br>Could contamination<br>with identified hazards<br>occur in excess of<br>acceptable levels or<br>could these increase<br>to unacceptable levels?<br>No – not a CCP<br>Yes – to Q. #4 | Q. #4<br>Will a subsequent<br>step eliminate<br>identified hazards or<br>reduce the likely<br>occurrence to<br>an acceptable level?<br>No – CCP<br>Yes – not a CCP | CCP<br>Yes or No |
|--------------------------------|--|--|--|--|--|------------------|
| 8. Cooking                     | Pathogen<br>survival<br>( <i>Listeria</i> )                            | Yes  | Yes  |  |  | Yes              |
| 10. Cleaning                   | Pathogen<br>growth and<br>toxin formation<br>( <i>Staphylococcus</i> ) | Yes  | No   | Yes  | No   | Yes              |
| 11. Brining<br>and<br>draining | Pathogen<br>growth and<br>toxin formation<br>( <i>Staphylococcus</i> ) | Yes  | No   | Yes  | No   | Yes              |

HACCP PLAN (FORM #9)

| Critical control point (CCP)                      | Significant hazard              | Control/preventive measure                | Critical limits  | Monitoring   |   |
|---|---------------------------------|---|--|--|---|
|   |                                 |   |  | What?  | How?  |
| CCP 1<br>8. Cooking                               | Survival of <i>Listeria</i>     | Heat process 5D <i>Listeria</i> reduction | 2 min at 100°C will provide internal product temp. of 80°C for 1 s | Conveyor belt speed<br><br>Temperature of cooker<br><br>Recorder chart | Conveyor speed with stopwatch<br><br>Recorder thermometer<br><br>Visual check |
| CCP 2<br>10. Cleaning<br>11. Brining and draining | Growth of <i>Staphylococcus</i> | Rapid processing time                     | 3 h maximum time between cooking and freezing                      | Product exposure to elevated temperature between cooking and freezing  | Visual observation of index tag   |

| Frequency        | Who?      | Records                         | Corrective action and records  | Verification   |
|------------------|-----------|---------------------------------|--|--|
| After each break | QC staff  | Conveyor belt monitoring record | 1. Segregate affected product and evaluate for safety<br>2. Record nonconformity CA log book   | 1. Verify the CA by QC Manager daily<br>2. QC to review cook log<br>3. QC Manager to observe cooking process and compare data with those obtained by the cooker operator |
| Continuous       | Automatic | Recorder chart                  | 3. Sign and date the CA taken<br>4. Determine the source of the problem and take measures to prevent recurrence<br>5. Retrain employees if necessary   | 4. Verification of the heat process<br>5. Calibration of the temperature recorder  |
| Hourly           | QC staff  | QC initial the recorder chart   |  |  |
| Hourly           | QC staff  | Process log                     | 1. Segregate affected product and evaluate for safety<br>2. Record nonconformity CA log book<br>3. Sign and date the CA taken<br>4. Determine the source of the problem and take measures to prevent recurrence<br>5. Retrain employees if necessary | 1. Verify the CA by QC Manager daily<br>2. QC to review cook log<br>3. QC Manager to observe cooking process and compare data with those obtained by the cooker operator |